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AUTHOR	Hawke, Sharryl
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ABSTRACT

The idea of computerized car pooling originated in an American Contemporary Issues class at George Washington High School in Denver, Colorado, in the fall of 1973 when a fuel shortage was imminent. The students saw car pooling as a way to take effective action and, with the expertise of a computer math class, devised a program capable of delivering information that matched students living near each other and attending school at the same hour. Although the student population did not respond as eagerly as hoped, the working community of Denver did, when newspaper, radio, and TV exposed them to the program's potiential. Response was great enough to require an Action Office and briefing teams of students to describe the program to the interested firms. City, state, and Federal governments also saw the potential of the program. At George Washington the experience brought self-confidence to those students involved, an interdisciplinary togetherness to the teachers, and a new reputation to the school as a viable institution for education. (JH)

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by

SHARRYL HAWKE
Writer
ERIC/ChESS

PROFILES OF PROMISE are descriptive brochures that highlight innovative social studies and social education practices, which teachers and administrators can easily adapt to their own classrooms or schools.

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Solving a Community Problem: COMPUTER CAR POOLING

Mark and Gary are conducting the briefing today. Their clients are representatives from the Air Force Accounting and Finance Center. During the one-hour briefing, Mark and Gary explain how the organization can develop a computer car pooling system for their 3,700 employees. They discuss the mechanics of collecting the necessary data and obtaining computer time to run the program. They also discuss the concerns of the representatives about the legal ramifications of employee car pooling and the best procedures for encouraging employee participation. Before the representatives leave, they make arrangements to contact Mark and Gary at a later time to work out the final details of the program for the Center.

With the current energy crisis and the pressing need to conserve fuel, car pooling is an alternative being discussed by many diverse groups around the nation. In Denver, Colorado, the core of car pooling efforts has centered not in a private organization or governmental agency but in a local high school, George Washington. Students of George Washington became interested in the possibility of car pooling early in the 1973 school year and developed a computer program to group people into convenient car pools.

As the energy crisis worsened during the fall and winter months of '73, the students found their program the subject of much attention. Because the George Washington program was ready to be put into operation by any interested organization or individual, the school became the clearinghouse for the pooling efforts of the entire Denver community. The briefing described above is one of dozens that have been conducted by students like Mark and Gary for Denver businesses and organizations.

THE IDEA IS BORN

The idea for computerized car pooling originated in an American Contemporary Issues class taught by William Stuber. Early in the semester students in the class were discussing the year 2,000 and the energy problems that would have to be confronted at that time. The conversation eventually turned to the present time and the current energy shortages: students began to consider what they could do personally to help alleviate the predicted fuel shortages. As Denver residents, they were particularly aware of gasoline shortages since there had been a severe shortage of fuel in the Denver area during the summer of 1973. The class members concluded that the use of car pools by George Washington students could greatly reduce the number of cars driven to and from the school each day. But how could a large scale pooling project be implemented without unreasonable expenditure of time and money? "Could a computer be utilized to arrange car pooling?" they asked.

Because the social studies class did not have technical expertise in computers, Stuber asked Dr. Irwin Hoffman, who taught the computer math class, if it were possible to use a computer to set up car pooling for the George Washington students. Hoffman referred the question to a student in his computer class who took the problem home over the weekend. He came back with the report that it would indeed be possible to use a computer to develop a pooling program, and he had a plan for making it work.

The first step was to obtain an accurate map of the Denver metropolitan area showing all the city streets; then a plastic overlay with a grid design was made for the map. The grid divided the city map into two-tenths of a mile squares, the equivalent of about two square blocks. With the grid, students could pinpoint an individual address and assign it the coordinates that would be fed into the computer. All together the grids cost about $125.00 to make, the cost of which was paid by the school.

The second step of the process was to develop an information form to be used in obtaining necessary data from participants. The basic information needed was the participant's name, phone number, address, beginning class or work time, and ending class or work time. This information along with the address coordinates was given to the computer. Using an algebra class of 35 students as a sample, the students perfected a computer program that would work for any number of participants.

The printouts from the computer program provide each participant with a list of four names of persons who have the same class or working hours and who live nearby. Most participants are pooled within 1/5 of a mile, but if the computer finds no potential pooler within this distance, it provides names

of persons within 2/5, 3/5, or 4/5 of a mile--up to two miles. The printout that a participant receives lists the names of the persons nearest him, their addresses, phone numbers, and distances from his home. Names are not necessarily confined to one list. It is up to participants to make their own arrangements for pooling.

Once the computer program was operational, students from the Contemporary Issues class and members of the Student Council undertook the task of building interest and enthusiasm for the project. An information sheet describing the program was given to all students and application forms were made available. The initial response by students was less than had been expected. In assessing the reasons, the program's promoters concluded that many students were already riding in car pools and therefore did not need to participate. They also detected a general apathy resulting from the common feeling that "the energy crisis won't affect me."

Eventually the students started a personal campaign in which each promoter personally handed out an application form to 20 of his friends. By December, 300 of the 2,700 George Washington students were participating in the program. However, the car pool enthusiasts expected many more students to apply for pooling when the fuel crisis became more acute.

While student response to the program was not overwhelming, the teachers and class members responsible for the program felt the idea was sound and was applicable to persons other than George Washington students. In fact, the program they had designed could be used to locate a car pool for any Denver resident who would apply for the program.

COMMUNITY INVOLVEMENT

The father of one of the students involved in the project is affiliated with a local radio station. When his son described the project to him, he arranged to have the story aired on the station. The *Rocky Mountain News* picked up the story and wrote an article about the project. Reporters from a major Denver television station saw the article, came to the school, and filmed a report which was run on the early and late evening local news. These media reports indicated that the George Washington students would be willing to provide the basic computer program to any firm or organization that wanted to arrange car pools for their personnel.

The public response to this announcement was "fantastic," according to Hoffman. The school began having four to five requests a day for consultation about car pooling. To handle the requests an Action Office was set up in the school; interested persons contacted the Action Office to schedule appointments for consultations, or "briefings" as they became known.

Requests came from all over the Denver area. Many business firms such as Blue Cross-Blue Shield, Great Western Sugar, Honeywell, and Johns-Manville Corporation met for briefings. The students also consulted with representatives from churches, hospitals, state agencies, and other high schools. The number of employees or members involved in these organizations varied from small groups of 40 or 50 to the 3,700 employees of the Air Force Accounting and Finance Center.

BRIEFINGS

Students from the computer math class were trained to handle the briefings. Because they had developed the computer program, they were well-versed in the technical details of the project. Since many of the representatives who came from the firms and organizations were computer specialists, communication about the mechanical details was relatively simple. Sometimes, however, representatives were not computer specialists. In these cases the students had to translate the language of computer technology into understandable terms for the layman.

In a typical briefing, an experienced student and another student who is learning to conduct briefings work with the representatives from a single firm or organization. The students first describe the basic computer program and explain that each organization must purchase its own map and overlay grid at the minimal expense of a few dollars.

Students then detail what data must be gathered and give the representatives copies of the forms which have been devised. Clients are shown how to read and assign address coordinates and how to code the coordinates on the application forms. If the representatives are unfamiliar with computer work, the students may spend considerable time training the people to do this work.

Representatives are shown how the data is to be keypunched onto computer cards. Firms are required to assign coordinates from the grids and key punch data cards for themselves. However, there are George Washington students skilled in computer operations who can be employed by the firm to do these jobs. Students hope eventually to computerize the locating of coordinates.

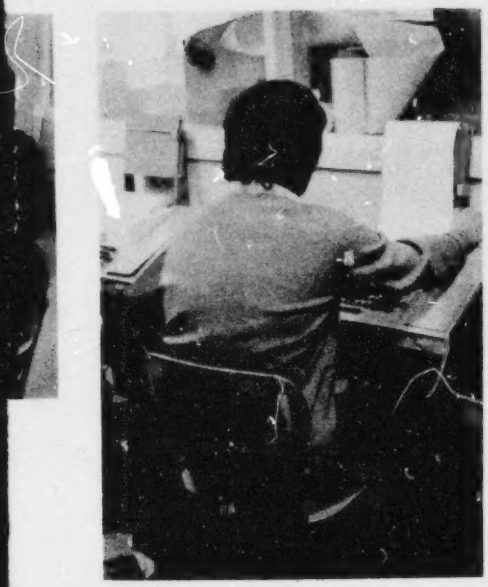
If the firm has its own computer, the organization may choose to run the program on its own equipment. Students are available for consultation if problems develop. If the firm does not have a computer availalbe, George Washington students will run the data cards for the firm using the computer owned by the Denver Public Schools; daily computer time has been allotted to the students for use in the project.

Technical aspects are only part of every briefing. Representatives are usually concerned about the human side of the program also. For example, the firm must decide if application for pooling will be voluntary or mandatory.

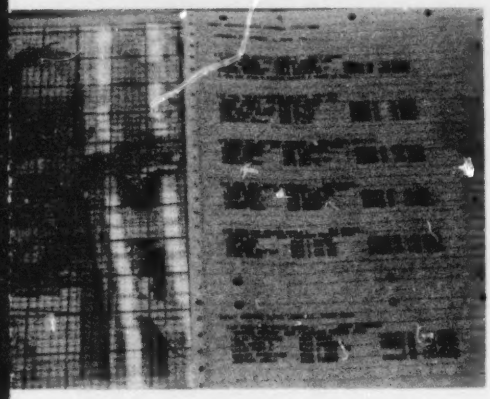
Mr. Stuber's Contemporary Issues class originated the pooling idea.

Ms. Taul and students in the Action Office set up appointments for briefings.

Briefing for hospital representatives conducted by students.



Student analyzes the latest printout.



From city map to computer printout.

Dr. Hoffman and Mr. Durand discuss new methods with student who developed the computer program.

In a voluntary program the firm distributes forms to its employees and runs data cards for those who return the forms. The other possibility is for the firm to run data cards for all employees, acquiring necessary information from payroll forms. Then any employee who is interested can receive his printout. Though the employee might not use the information on a regular basis, he would have names of people he could contact in the event he needed a ride on a particular day. Students explain the experiences other firms have had in using both methods to the representatives.

Another common concern of representatives is the question of legal liability. Students do not give legal advice but do show the clients the disclaimer that accompanies forms given to George Washington students. They also point out the statement that appears on each form cautioning a participant to make certain his auto insurance is valid before applying for the program.

Several of the briefings have proven to be times of real sharing for students and representatives. During one briefing early in the project, a representative suggested a method of sorting addresses by zip codes before locating them on the grid; the method was adopted and has become a valuable time-saver. Another representative shared with the students his knowledge of a similar computer program that had been designed for the city of Honolulu by the I.B.M. Corporation. The students corresponded with the Honolulu developers in an effort to benefit from their experiences. The communication between community and school has steadily improved the program.

Often when the business representatives come to the school for the briefings they expect to talk with the teacher, not the students. Though Hoffman is usually in the room during briefings, he has made the students responsible for the consultations, and the representatives soon realize that the students know what they are talking about. Hoffman believes that it is unusual to find a 16-year-old "kid" advising a prominent businessman on a program affecting hundreds of people.

POLITICAL INVOLVEMENT

As the community response to George Washington's project grew, the expertise available in the school became known throughout the city. In December, the mayor of Denver announced a city-wide energy conservation program, Project Energy. To help implement the program the mayor appointed an 18-member Citizen's Energy Management Advisory Council to make recommendations to the city and private business on energy conservation. On the committee were presidents and vice-presidents of major business firms, representatives from leading civic organizations, and a student from George Washington High School, who was selected especially because of the George Washington pooling project.

A state representative from Denver also called upon students in the class to explain their program to a special legislative committee studying the energy crisis. After their initial appearance before the committee, the students were asked to return to explain in detail how a pooling system could be set up for the vast number of state employees working in the Denver area. When legislators began writing legislation dealing with problems of liability in car pools, they contacted Stuber and his social studies class for suggestions and feedback.

Reports of the George Washington program circulated beyond the Denver area. The Allen Vorhees Company, a consultant firm, was preparing a report on car pooling for the U.S. Department of Transportation. In searching the country for people knowledgeable about pooling, they were referred to George Washington High. After talking with Hoffman, they arranged to fly him and one student to Washington to explain their program. Upon hearing details of the system, the Vorhees representatives concluded that the George Washington program was the most refined operation of this nature in the country.

EFFECTS OF THE PROJECT

George Washington's car pooling project has not been without its problems. Educationally the most serious drawback has probably been the relatively small number of students who have been closely involved with the program. While the Contemporary Issues students and members of the Student Council have had a role in promoting the program, the actual implementation has been effected by students in the computer math class. The technicality of designing a computer program requires students of special competence and ability and therefore limits involvement to a relatively few pupils.

While student participation has been limited, the project has been quite advantageous for those students who have been involved. For the Contemporary Issues students who originated the program there has been the satisfaction of knowing that they responded to a community need with an idea which was practical and effective. For the math students there has been similar reward in solving a problem which is not hypothetical but a genuine societal problem. The level of student interest was shown by the long hours the class members contributed to the project; for weeks they came to school early and stayed late to work out details of maps, grids, forms, and cards.

The opportunity to work with community adults in the briefing sessions and in the governmental committees has built the self-confidence and poise of the students. It has provided students and adults with a common ground for communication, enhancing respect between the generations. Hoffman also points out that students "are learning to be concise, not to promise more

than they can deliver." The young people are enthusiastic about playing a role in meeting the needs of society. One student said, "This is where it's at--solving the community's problems through technology."

For the teachers who have been involved in the project there has been the opportunity to see students in a new light. Particularly for Hoffman and the math students, the relationship has changed from the traditional teacher-student to a colleague-to-colleague pattern as they work together to solve mutual problems. He expects a considerable amount of work from the students, but the students who have been involved in the project have been willing to meet his expectations.

The pooling project has also provided an avenue for interdisciplinary communication between teachers. In addition to the original sharing between Stuber and Hoffman, the school's activity director, Ms. Rachael Taul, has been instrumental in involving Student Council members and overseeing the Action Office. Another computer teacher, Arthur Durand, has been enlisted to work out further refinements of the program.

Perhaps the most long-lasting impact of the George Washington project will be the effect it has on the school itself. Taul reports that people who had not been in a high school for years were wandering the halls of George Washington. "They are amazed at what they see. It is changing some of their concepts about schools," she said. Hoffman adds that, "People are getting a first-hand opportunity to see that the high school is a viable institution."

Community citizens who have been to the briefings confirm this view. The representative from a participating church group reports that he was amazed at the knowledge and communicative ability of the students. He found them well-informed and eager to be helpful. Because George Washington had been the scene of several racial incidents in years past, the representative said he was personally pleased to find a spirit of harmony and cooperation in the school at this time. He was impressed with the interest of the teachers not only in the pooling project but in the general good of the students as well. In sum he described the project as an "exciting" and "meaningful" endeavor, both for the school and for the community.

THE FUTURE OF THE G.W. PROJECT

The future of the pooling program itself is difficult to predict. Reflecting on the limited response of the student body to the opportunity for pooling, Stuber feels there may not be a truly significant interest in pooling unless gas rationing becomes mandatory. Hoffman feels this is also true for the community as a whole. "The first morning some person can't get to work because his car is out of gas and he has no ration coupons, he'll want to know whom he can call on for a ride to work." Similarly when companies find a large number of employees absent because they do not have gas to get to work, management is going to take steps to help employees get to the job. One of those steps may be to see that every employee knows the names of several people in his neighborhood with whom he can ride to work.

Whatever happens to car pooling in the future, the George Washington project has demonstrated that a school can play an important role in helping to solve a specific community need. Encouraged by the success of the pooling project, students and teachers are considering other ways in which they can contribute to the community. Stuber's Contemporary Issues class is discussing alternative sources which might be used to heat some of the classrooms at the school. Hoffman's computer students are exploring additional uses businesses might make of their computer program, such as improving delivery services or relocating employees in branch offices nearer their homes. With this approach to education the students, the school, and the community all benefit.

ERIC DOCUMENTS

ED 077 781 - **The Cities: A Problems Course.** Units I-VII and Reference Section. 541 pp. Available from ERIC Clearinghouse for Social Studies/Social Science Education, 855 Broadway, Boulder, Colorado 80302 (for loan only). This is a pilot version of an urban studies course, designed to help high school students understand concerns and problems in contemporary American cities.

ED 076 006 - **Computers: Tools for Today.** 96 pp. Available from Childrens Press, 1224 West Van Buren St., Chicago, Illinois 60607, $4.75. This is an introduction to computers which can be used by readers as young as the middle school. In addition to presenting simple explanations of how computers work, simple problems in which readers can write their own programs are included.

ED 075 272 - **Social Studies: Application Units.** Course II, Teachers. Computer-Oriented Curriculum. REACT (Relevant Educational Applications of Computer Technology). 118 pp. MF-$.65. Available from Technica Education Corporation, 655 Sky Way, San Carlos, California 94070, $1.65. This book is designed to introduce teachers to the two major applications of computers in the social sciences: simulations and data analysis. A bibliography is included.

ED 071 949 - **Inner City Project: Student Initiated Research into Problems of the Inner City.** Project Canada West. Annual Report. 23 pp. MF-$.65, HC-$3.29. Project Canada West is a secondary curriculum project, designed to promote student initiated research into problems of the inner city.

For further information, write:

Depending on which fact of the computer program you are interested in, you may write any or all of the following persons:

Vic Peters, Chairman, Math Dept.
William Stuber, Social Studies Teacher, Contemporary Issues
Irwin Hoffman or **Art Durand**, Math Teachers, Computer Math
Mark Frank, Gary Kortz, Lamarr Hollis, students implementing the computer program

at:

George Washington High School
655 S. Monaco Parkway
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